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Board 117: WIP: Exploring the Teaching Journey of Early-career Engineering Faculty

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WIP: Exploring the teaching journey of early-career engineering faculty

Abstract

This work-in-progress paper explores the teaching experiences of early-career engineering faculty in their initial semesters of a faculty position. The challenges of starting a new faculty position make it one of the most critical moments in a faculty's career. Each individual will encounter specific challenges based on their held identities and institutional culture, but teaching is often a shared obstacle among them. One-on-one, 60-minute semi-structured interviews were conducted with engineering faculty members who have less than two years of total teaching experience as an instructor. The first stages of Campbell's Hero's Journey were used to facilitate the dialog and provide a narrative structure to the interview. The participants were asked questions related to three aspects of their teaching story: (1) the call to adventure, (2) challenges on the road, and (3) finding help. Preliminary findings indicate that early-career engineering faculty who participated in the study experienced challenges related to planning and operationalizing their lessons (e.g., knowing how to select content for their lessons), using the learning management system, and navigating online classroom environments. Further, analyzing the data through the lens of Schlossberg's Transition Theory helped identify that the support structure used to cope with challenges was informal mentorship, i.e., participants sought support from senior peers who had taught the same classes they were teaching and built their material from existing resources. These findings provide a first step in creating specific professional development activities for both new engineering faculty and new faculty generally to improve their experience in teaching.

Introduction

New faculty members face a variety of practical challenges during the initial semesters of a faculty position, requiring them to develop strategies to cope with this transition. The challenges of starting a new faculty position make it one of the most critical moments of the faculty career [1]. A new faculty position generally implies a significant emotional and personal investment on the part of the faculty member [2], which creates underlying pressure to perform successfully in every aspect of the job.

While each faculty member encounters specific challenges connected to their held identities and institutional culture, the literature on early-career faculty challenges suggests some shared challenges, such as lack of recognition, ambiguous expectations, lack of collegiality, work-life balance issues, and difficulties managing service, research, and teaching [2-12]. Teaching presents unique challenges due to a lack of preparation during their professional training and formation [13, 14]. This lack of training can impact student success and negatively influence student experiences, which directly impact engineering students' decisions to persist in the field [15]. Engineering faculty members' teaching skills remain generally untested until they assume a faculty position and must adapt to its associated responsibilities and challenges and responsibilities [6].

Investigating the experiences of early-career engineering faculty during their transition to the faculty profession is important for ensuring that interventions are adequately designed to support their teaching development. This study used semi-structured interviews to investigate challenges and support structures that early-career engineering faculty experience during their initial transition into the classroom. The outcome of this study will help faculty personally reflect on their teaching experiences and support the design of appropriate professional development activities addressing actual challenges that early-career engineering faculty face.

Positionality

The primary author of this paper is an international graduate student in an engineering education program who aligns with a social-constructivist perspective, which centers his understanding of the phenomena based on participants' experiences. The author's graduate student status allowed the participants to freely talk about their challenges without any sense of peer judgment since the author was in a learning position. Although the student's position helped the interview process, recruiting participants was a challenge supported by the remaining authors who identify as engineering faculty.

Theoretical Underpinning
Campbell's Hero's Journey

Campbell's Hero's Journey was used to design the semi-structured interviews for this project. The Hero's Journey is based on the work of Joseph Campbell, published in 1949 [19]. Campbell analyzed numerous myths and stories from different cultures and spaces and identified a typical narrative structure called the monomyth or the hero's journey. The first motive for using the hero's journey as a framework for designing the interview protocol was to highlight faculty's importance and impact on the higher education system. Our approach aimed to frame them as heroes/heroines, which is defined [16] as a man or woman who was able to overcome "their personal and local historical limitations" (p. 15) to become a new person that can teach lessons they learned during the process. We expected to facilitate each faculty member's narrative by having them create a mirror character that allowed them to present their experiences from an emotionally safe position.

The hero's journey provides a semi-chronological narrative structure that may help the participants to reflect on and structure their experiences [17-19]. Other authors in engineering education have used the hero's journey as a tool to structure and develop smooth narratives. Cruz & Kellam [20] used the monomyth structure to investigate how engineering students decide to enter the engineering field and identified it as a "way to think about the structuring of stories" (p. 562). Boklage et al. [21] also used the monomyth structure as a coding scheme to study engineering faculty's journey in changing their pedagogies. Outside of engineering education, Tsuda-McCaie, and Kotera [22] used the Hero's Journey structure to parallel the themes they identified when studying millennials' career change, concluding that the hero's journey structure "supports career changers to assimilate discontinuity into a narrative of continuity" (p. 11). This research focused specifically on the departure arc of the monomyth structure by investigating the faculty's call to the role, challenges, and support sources (or supernatural aid) during their initial

semesters of teaching. Specifically, the participants were asked questions related to three aspects of their teaching story: (1) the call to adventure, (2) challenges on the road, and (3) finding help.

Schlossberg's Transition Theory

Starting a new position as a faculty was considered in this study as a transition that our participants to passed through, with a particular focus on the event of starting to teach. Schlossberg's Transition Theory [23, 24]was used as a lens to view this transition and to better understand the emergent themes related to early-career faculty's experiences of the teaching environment and the types of support resources they used to cope with their transition into the classroom. The framework has been used to assess transitions for various populations, including graduate program alumni [25], engineering faculty [26], and military veterans [27].

Methods
Participants and recruitment

The participants (Table 1) for this study were early career faculty at a Southwest research-intensive (R1) University. Early-career faculty were defined as any faculty with four or fewer semesters of experience in an academic educator role (i.e., employed as full-time, part-time, or adjunct faculty members). Five participants agreed to participate in the interview phase. All participants were in the first year of their faculty career. Four participants identified themselves as male, and four participants held a tenure-track position. The type of classes they were teaching during the interviews were predominantly upper-level electrical engineering and computer science classes. Although all participants reported having an academic background, only four of them held a doctorate student or postdoctorate position right before starting their faculty position. Four of them indicated having an industry background, but only Ironman had an extensive career in industry.

Data collection

Data were collected through semi-structured interviews via Zoom. The interviews were structured around three sections guided by Campbell's Hero's Journey and Schlossberg's Transition Theory. The first section asked about the participants' backgrounds to understand what motivated them to pursue a faculty career (e.g., "Was there a meaningful event in your journey that made you choose a faculty career pathway?"). The second section focused on how participants experienced starting to teach as faculty to identify which types of opportunities and challenges they identified during this stage of their careers (e.g., "Did you need to create new content? How did you decide how to assess your students?"). The third section aimed to bring to the conversation the sources of support they received and how they used such support (e.g., "What materials did you use for professional development?"). The protocol was designed in a way that could help faculty to share their experiences in a semi-chronological order. The duration of the interviews averaged 42 minutes (min: 34 min, max: 48 min).

Table 1 - Participants' demographics

Name	Position	Department	Course Level	Number of teaching semesters at the Institution	Professional Background	Gender Identity
Ironman	Professor of Practice	Electrical Engineering	200, 400	One	Academia, Industry	Male
Captain T	Assistant Professor	Engineering Education	200	One	Academic	Male
Professor H	Assistant Professor	Computer Sciences	500	Two	Academia, Industry	Male
Doctor K	Assistant Professor	Computer Sciences	500	Two	Academia. Industry	Preferred not to Answer
Sherlock	Assistant Professor	Electrical Engineering	500	One	Academia	Male

Data Analysis

The interview recordings were transcribed and later coded using thematic analysis in Dedoose [28]. We first performed an active-reading session on three randomly chosen transcripts to support researchers' familiarization with the data. A codebook was created based on memos generated in response to these transcripts, the main topics of the research questions (teaching challenges and sources of support), and elements of Schlossberg's transition theory (previous experience and strategies for success). All transcripts were deductively analyzed using the codebook, which resulted in a group of excerpts for each code. A second round of analysis was performed with the excerpts only, and new codes were generated inductively. Lastly, emergent second-round codes were combined with first-round codes to develop the following themes: Teaching Challenges, Anxiety, Content Organization, Implementing/Using New Tech, Sources of Support, and Institutional Professional Development (see Table 2)

Preliminary Findings
Teaching challenges – anxiety

Most early-career faculty expressed feeling anxious, pressured, and tense teaching their first classes as faculty members. When talking about this feeling, they connected it with statements related to underlying beliefs about their identities as faculty members and students' expectations, such as the idea that faculty cannot make mistakes. One participant recalled their first day teaching a new class exemplifying the anxiety of teaching "right", saying, "So walking into that class … and seeing 100 students at the time and … realizing you have to record [the class] for another 120 [online] students … it's a little like, gulp. Like, 'Wow, I hope I do this right because there are a lot of eyeballs on me right now'" (Ironman).

Teaching challenges – content organization

When discussing planning classes and creating new courses, participant faculty struggled to identify which topics fit best for students. One participant described this challenge when talking about creating a new course, stating, "So, there are two challenges, one is how can I merge security with privacy and how can I explain this to students even before they enroll in this course. That's probably the most challenging part." (Professor H). In this quote, the participant describes his frustration in deciding how his new course should present new content and satisfy students' expectations. This challenge can be related to their lack of experience designing learning experiences for engineering students.

Teaching challenges – implementing/using new technology or teaching methods

When faculty were asked about their experiences in the classroom, most described issues using the university's learning management system, managing technology in hybrid settings, or using teaching methods that they were not used to. Professor H described his issues in teaching online, saying, "I guess the quality of the lecture was slightly lower because it was online [and] I couldn't engage with the students. That was the disadvantage of it.". Although he is a faculty who teaches technology content, he perceived losing students' engagement in online classes.

Source of support – informal senior peer mentorship

The primary source of teaching support the participants described was senior peer mentorship offered to junior faculty on an informal basis, as described by Sherlock: "But I do speak to a few other colleagues in the department to get some advice on what to do with the course if I feel I'm not getting the right amount of engagement, in some sense. So, when I speak to the other faculty who have been here four to five years ..." (Sherlock) According to the participant, senior faculty in his unit were open to helping him with his challenges engaging students. The experience shared by his senior peers was the most important aspect of their interaction.

Table 2 - Preliminary codes, themes, and excerpts

Themes	Codes	Excerpts
Teaching Challenge	Anxiety	"So walking into that class and down that auditorium and turning around and seeing 100 students at the time and in realizing you have to record it for another 120 (online) students or 31 students, it's a little like, gulp. Like, "Wow." I hope I do this right because there are a lot of eyeballs on me right now." (Ironman)
	Content Organization	"So, there are two challenges, one is how can I marge security with privacy and how can I explain this to students even before they enroll in this course. That's probably the most challenging part." (Professor H).
	Using New Technologies	"I guess the quality of the lecture was slightly lower because it was online. I couldn't engage with the students. That was the disadvantage of it." (Professor H)
Source of Support	Informal Senior Peer mentorship	"But I do speak to a few other colleagues in the department to get some advice on what to do with the course if I feel I'm not getting the right amount of engagement, in some sense. So, when I speak to the other faculty who have been here four to five years..." (Sherlock)
	Institutional Professional Development	The workshops that I participated in literally... They have guiding theory, but they don't really talk about theory, like regular research things. So talk a little bit about theory and talk about how to apply those theories to your actual teaching scenarios." (Captain T)

Source of support – institutional professional development

The participant faculty also recognized that their institution provides support with teaching and learning. This source of support did not seem to be viewed as extremely beneficial for faculty, since they only commented about this type of support when asked specifically about institutional support. The following quote demonstrates how participants talked about experiences garnered during workshops" "So I would say it's more like a convoluted procedure.... The workshops that I participated in literally... They have guiding theory, but they don't really talk about theory, like regular research things. So talk a little bit about theory and talk about how to apply those theories to your actual teaching scenarios" (Captain T).

Implications

Preliminary data collected from this study provided insights into the experiences of early-career engineering faculty when starting their teaching careers. The first outcome was feelings of anxiety described as related not only to the new position or new institution but to starting to teach specifically. An underlying high-performance expectation from students and the institution/unit combined to make faculty feel pressured to identify ways to support student learning. This finding should redirect institutions' attention to the well-being of educators, especially during the current post-pandemic time.

The second outcome was a reliance on senior peer mentorship in the absence of what faculty considered worthwhile opportunities to learn more about teaching. Institutional professional development should help faculty discover alternative, student-focused teaching methods to improve the learning experiences of their students. Those spaces should be made available to those interested in improving their teaching strategies. New teachers need to be able to share questions, challenges, and successes with their peers. Activities such as book clubs, peer meetings, and mentoring programs can offer faculty such opportunities.

The interactive and social domain of professional development appeared to be essential for supporting participants' learning experiences. Further research in this space is necessary to explore how connections like informal mentoring occur. Since senior faculty seems to have a substantial influence on new faculty teaching, future researchers can investigate the implications of senior mentoring in new faculty teaching and its impact on how new engineering faculty perceive teaching and participation in faculty development interventions. We also recognize the sample limitations of this work in progress; work is ongoing to collect the perspectives of early-career faculty from different institutions. We expect that the preliminary results of this work can advance improvements in the way faculty development interventions are designed in schools of engineering.

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